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EXERCISE AS A TOOL FOR HEALTH PROMOTION  
IN OLDER PEOPLE: A LITERATURE REVIEW

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## ABSTRACT

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## EXERCISE AS A TOOL FOR HEALTH PROMOTION IN OLDER PEOPLE; A LITERATURE REVIEW

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As people live longer there is now a larger population of elderly people, with this group suffering a higher prevalence of ill-health. The aims of this literature review are to examine the age-related physiological changes that increase the risks of deteriorating health in older people, identify some of the mechanisms whereby exercise may realistically slow down health deterioration in older people and prolong their ability to carry out daily activities, identify which exercises are most beneficial as a tool for health promotion in the elderly, and try to define what the nurse's role is in using these exercises. The goal of this literature review is to make nurses more aware of the usefulness of regular exercise or physical activity as a tool for health promotion, and to highlight the important role nurses can play in the delivery of these exercises or activities.

Regular exercise or physical activity has many benefits with regard to health promotion in the elderly. It can help to regulate weight, blood pressure, cardio-vascular disease, type 2 diabetes mellitus, and many others. As a person gets older their physical well-being can rapidly decline and they can lose their ability to carry out everyday tasks such as washing and eating. It is important that older people are encouraged to undertake some form of regular physical activity in order to slow down this decline and to prolong the ability to independently carry out activities of daily living (ADL). Nurses can play a crucial role in this aspect of health promotion by explaining the benefits, encouraging elderly people to participate, and as part of a multi-professional health care team, help to tailor these activities to suit each individual according to limitations.

The literature researched has shown that regular exercise or physical activity has many benefits as a tool for health promotion in older people. The literature has also shown that the benefits can be achieved through different types of exercise from aerobics or endurance training, weight or resistance training, or repetitive exercises aimed specifically at activities of daily living such as transferring between a bed, walking set distances representing the distance between rooms in a house, and stretching to mimic the movements of dressing. Limitations of the research, such as inconsistencies in the type, duration, and intensity of the exercises used in the different studies, as well as the specific targeted area of the body make it difficult to say what the most beneficial

exercise prescriptions are with respect to health promotion in older people, and further, more specific research will need to be done in the future in order to find this out.

## CONTENT

1 INTRODUCTION.....	4
2 LITERATURE REVIEW.....	8
3 THEORETICAL BACKGROUNDS OF BENEFITS OF EXERCISE.....	11
4 SOLUTIONS TO THE RESEARCH PROBLEMS.....	13
4.1 How regular exercise or physical activity can affect physiological changes.....	13
4.2 Exercises that are of most benefit as a health promotion tool for the elderly....	14
4.3 The nurse's role in the use of these exercises.....	15
5 IMPLEMENTATION OF THE RESEARCH.....	16
5.1 Purpose and aims of the research.....	16
5.2 Research materials and methods.....	19
5.3 Analysis of the material.....	19
6 RESULTS AND CONCLUSIONS.....	25
7 REVIEW OF RELIABILITY.....	25
8 DISCUSSION.....	27
8.1 General discussion.....	27
8.2 Ethical discussion.....	27
REFERENCES	30

## 1 INTRODUCTION

During a period of practical training as a student nurse in an elderly care facility it was observed that many residents had lost their ability to independently carry out normal everyday tasks. Although the precise reasons for this loss of independence are not known, it was noted by the author that when first moving to the elderly care facility many of the residents were suffering from illnesses such as Alzheimer's disease or other dementia-related illness with no obvious physical ailments that would inhibit them from performing these tasks. However, after a relatively short time in the facility their physical condition had deteriorated to such an extent that they were no longer able to carry out simple tasks such as washing or dressing, and on questioning the facility staff one indicator of this was a lack of regular exercise or physical activity.

As my studies as a student nurse progressed and as I attended more and more practical training placements I began to take a real interest in the subject of regular exercise or physical activity for residents of elderly care facilities and how these exercise or activities could be used as a means of health promotion and help elderly people retain their independence to carry out simple every-day tasks for as long as possible.

In one particular facility that I do not wish to name to reduce the risk of identifying the resident I came across a gentleman about 70 years of age. He was completely bed-ridden and was unable to feed or carry out any task by himself. Only very occasionally could he communicate by speaking and his body had no very little muscle mass. There was a photograph of this gentleman playing with his grand-children in the gardens of the care facility, which I learned was taken the previous summer, a little over one year before. He looked to be a fairly healthy-looking man of average build for someone his age and I found it difficult to believe he had deteriorated so quickly. I carried out a little investigation and discovered that he was suffering from Alzheimer's disease, which is a severe form of dementia. I asked my mentor at that time why he had deteriorated so quickly I was informed that because of the severity of his symptoms, including mood swings and aggression, the staff was unable to leave him by himself for long periods, he needed constant supervision and they simply did not have enough staff to allow for that. Subsequently he spent a long time in his room. Although my mentor did not say so

herself, it is my belief that had he been given more exercise he would not have deteriorated so quickly.

I must stress however that I am not any kind of expert in this matter and I could of course be mistaken in this belief. Indeed, in an article published on-line by the American Health Assistance Foundation (AHAF) they explain that in the third stage of development of Alzheimer's the disease can cause a loss of control of bodily functions and the sufferer will require constant care. However, in the same article AHAF write that exercise is an important activity and that care givers should discuss exercise plans with their patients and families so that an appropriate exercise program can be tailored for their specific needs. They go on to say that studies conducted on people with mild cognitive impairment (MCI) indicate that aerobic exercise may improve cognitive agility.

Whilst it has not been proven that exercise could prevent Alzheimer's disease or slow its' progression, some studies involving animals and other preliminary human studies have produced significant interest amongst scientists. But of course, larger, randomized controlled trials will be necessary before a definitive statement on the role of exercise in the prevention of Alzheimer's disease can be made. Even without this concrete evidence in the role of exercise as a preventative measure in Alzheimer's progression health care providers should be aware that developing an exercise program as part of an Alzheimer's disease patient's routine may also be helpful with maintaining muscle strength, decreasing frailty, and improving their mood (American Health Assistance Foundation, 2012. pages 2 & 3).

What I can say without fear of being mistaken is that during my short time at this facility, about 6 weeks training and 8 weeks working, I never once saw any organised regular exercise program or physical activities being provided to the residents. There was regular entertainment in the form of singers or musicians but I only ever saw one resident leave the building regularly and that was so she could go and smoke a cigarette, and sometimes a member of staff would take a single resident into the grounds, usually on a wheelchair.

It is this author's belief that if elderly care facility residents are encouraged to undertake regular exercise or physical activity then the decline in their ability to carry out tasks

independently could be considerably slowed, subsequently giving them a better quality of life for a longer period.

In order to satisfy those beliefs the author intends to carry out a review of the current literature on the benefits of exercise for elderly people in helping to prolong their independence. The aims of this literature review are to examine the age-related physiological changes that increase the risks of deteriorating health in older people, identify some of the mechanisms whereby exercise may realistically slow down health deterioration in older people and prolong their ability to carry out daily activities independently, identify which exercises are most beneficial as a tool for health promotion in the elderly, and try to define what the nurse's role is in using these exercises. The goal of this literature review is to make nurses more aware of the usefulness of regular exercise or physical activity as a tool for health promotion, and to highlight the important role nurses can play in the delivery of these exercises or activities.

The simple tasks or daily activities mentioned above are known collectively within the health care industry as Activities of Daily Living (ADL) and there are many pieces of literature describing what they are and how to assess them. There has been a model of nursing developed in the United Kingdom by Nancy Roper, Winifred W. Logan and Alison J. Tierney based around these daily activities. The model has been developing for over 20 years and according to an article written by Mary O'Connor in May 2002 entitled "Using the Roper, Logan, Tierney model in a neo-natal ICU", published in the Nursing Times.Net internet website, it is used extensively in many areas of nursing in the UK, from neo-natal settings through to intensive care (O'Connor, 2002).

Roper, Tierney and Logan state in their book that ADLs are the focus of their model because they are central to their own views of what nursing is and that nursing is viewed as helping patients to prevent, alleviate or solve, or cope with problems related to activities of living. They write that they have developed their model of nursing in order to help nurses identify and understand the complexities of nursing and so help them to provide effective and compassionate nursing for people of all ages, in different health care settings, and who may be suffering from various problems. They also hope to provide a framework for nurses to plan individualised nursing for nurse-initiated interventions that are related to a person's activity of living.

Their model is based around twelve activities that they say are essential parts of a person's daily life, including such tasks as washing, eating, communicating, eliminating, maintaining a safe environment, and mobility. They explain that by carrying out regular assessments of someone's ability to carry out these tasks enables nurses to formulate an appropriate care plan. For example, an elderly care home resident may be physically healthy and free from disease but due to natural declines in muscle mass they may become dependent on a walking aid to assist mobility, or a person's psychological status may mean their memory is fading and so they become dependent on other people to maintain their safe environment (Roper, Logan & Tierney. pages 25-63).

In a separate article entitled "Activities of Daily Living: What are ADLs and IADLs?" by Kernisan & Scott they describe ADLs in much the same way as the 12 mentioned by Roper, Tierney and Logan but include more complex tasks such as managing medications, driving or utilising public transport, shopping, cooking, housework, and using telephones or other communications devices. (Kernisan & Scott 2011).

It is extremely important that nurses and other caregivers assess a person's ability to carry out these ADLs to determine what type and how much care a person needs in order to function independently. These assessments also enable health care facilities to set aside adequate resources for care provisions. There are several examples of ADL assessment tools available to nurses and caregivers, one such example being the Katz Activities of Daily Living Scale.

So how does the Roper, Logan, Tierney model of nursing relate to this particular thesis? It is hoped to convince the reader that this review will show that regular exercise or physical activity can have positive effects on the elderly as a tool for health promotion, whether it be on the physical, sociological, cognitive or physiological aspect of their well-being. I believe that if nurses and other care givers can educate themselves on the benefits of the Roper, Logan, Tierney model of nursing and how to use available ADL assessment tools correctly then they can provide a more holistic type of care. Nurses would be able to use the components of the Logan, Tierney and Logan nursing model when assessing the exercise or activity needs of their patient in maintaining their ability to carry out ADLs.

## 2 LITERATURE REVIEW

One extremely important aspect of completing a Bachelor's Degree Programme in Nursing is the successful completion of a thesis. There are several options on how to complete this thesis, including, but not limited to, being part of a wider project or study, carrying out your own study, or carrying out a literature review. Quite often students have very little idea of what type of thesis they will become involved in, and indeed many do not even have a particular subject in mind in which to direct their thesis. For this reason the students at Kemi-Tornio University of Applied Sciences have had several tutor sessions in which they have been given direction on possible studies or projects in which they could become involved with, discussed possible topics for independent studies, and given guidance on what is expected of a Bachelor thesis. After several discussions with various tutors and after changes in ideas and direction it was mutually agreed between the author and mentors that this thesis would take the form of a literature review, with the chosen subject of "The benefits of exercise for elderly people".

So what is a literature review? In the publication by Pam Moule and Margaret Goodman entitled "Nursing Research, An Introduction" it is written that a literature review is an evaluation of research that has already been carried out on a particular topic. This evaluation can be carried out for many reasons. E.g. in order to support a proposal for research, or when introducing a research report, and, as in this case, as a thesis or dissertation. They say that doing a literature review can sometimes be laborious and difficult but also that it is an important aspect of the research process which, when done correctly can avoid wasting time and effort at a later stage of the said process.

A literature review is also described as a systematic framework that is structured, has enough detail to enable the reader to replicate the review, and includes critical appraisal of all the literature used. They write that there are two types of literature review: A 'Narrative literature review' and a 'Systematic literature review' and that there are significant differences between the two. Some examples of these are: Focus. A narrative review mostly looks at a broad range of issues and brings them together in an overview,



whereas a systematic review will normally focus on one specific question and does not usually provide an overview of the whole topic. Search Strategy. This is often unstated or implicit in a narrative review and in a systematic review is very explicit about inclusion and exclusion criteria.

Another area which differs greatly is in how sources are selected. In a systematic literature review there is always a comprehensive selection of literature, and selection bias is avoided; on the other hand in a narrative review the literature chosen is often selective and can be subject to conscious or subconscious selection bias.

Carrying out a literature review helps researchers to answer many questions about their chosen research topic. For example, it informs researchers about current knowledge of their topic, what have been the main problems that have been researched so far, what aspects of their topic have not been addressed, and what, if any recommendations have previous researchers made in relation to further study of the topic?

Before carrying out a literature review the researcher obviously needs to decide on the exact topic that they wish to review, a similar process when deciding on a question for a study. Once they are sure of their topic the researcher can then retrieve the required literature, which will then be read and critically appraised. These processes enable researchers to not only gain knowledge about previous research carried out on their topic, but also highlight any gaps or areas in the research that require more study. Moule and Goodman advise researchers to have a set of generic questions to ask of each piece of reviewed literature, and to write down answers to these questions on a formatted sheet. These questions should target areas of the literature such as the title, the author(s), abstract, introduction, methodology, sample selection, ethics, results, discussion, recommendations, and references. Carrying out these question and answer sessions can help the researcher to assess the reliability and relevance of the literature, help the researcher to retrieve important information from the selected literature, and avoid the necessity of reading all the literature over and over. Once all the relevant information has been retrieved and critically appraised the reviewer is then able to write their review (Moule & Goodman, 2009. Pages 137-149).

As stated previously there are two different types of literature review, narrative and systematic, with each type aiming to provide information about previous researches on

differing levels. It is the author's intention to try and provide an up-to-date and broad view of the topic of exercise as a tool for health promotion and so it is felt this would be better served by carrying out a narrative review of the available literature.

In the Moule and Goodman book it is written that the aim of a narrative literature review is to simply convince the reader that the research study is necessary and that it represents the next stage in building up knowledge about the topic. The narrative review will discuss relevant findings, it will comment on the methods used, and will highlight any strengths or weaknesses of the reviewed literature. This should enable the reader to see that all previous researches on the topic have been examined in a considered manner and that the research study was indeed necessary (Moule P & Goodman M. Ch.9, pages 146-147).

In an editorial by Edna Terezinha Rother it states that narrative literature reviews have an important part to play in continuing education of a subject because they provide current knowledge of that subject. It is also written that this type of review uses a qualitative approach to research and do not provide answers to specific quantitative research questions. A narrative review provides neither a list of the databases or methodological approaches used to conduct the research, nor knowledge of the inclusion or exclusion criteria used when selecting research articles or materials (Terezinha Rother, 2007).

In an interesting article from the Human Reproduction Update written by Collins JA and Fauser BCJM they provide information on how to decide between doing a systematic or narrative review in order to impart information onto the reader, and give guidance on the strengths and weaknesses of both types. They say that systematic literature reviews provide clear and concise quantitative information about specific questions but do not allow for comprehensive coverage of a topic, whereas the more common narrative review can cover a wide range of issues within a topic (Collins & Fauser, 2005).

As with any type of research there needs to be some purpose or reason, which for this literature review, as previously stated, is in order to complete a bachelor degree thesis. The research must have specific aims or goals that the researcher wishes to achieve. The aims of this literature review are to:

- Examine the age-related physiological changes that increase the risks of deteriorating health in older people.
- Identify some of the mechanisms whereby exercise may realistically slow down health deterioration in older people and prolong their ability to carry out ADL and IADL independently.
- Identify which exercises are most beneficial as a tool for health promotion in the elderly, and try to define what the nurse's role is in using these exercises.

The goal of this literature review is to make nurses more aware of the usefulness of regular exercise or physical activity as a tool for health promotion, and to highlight the important role nurses can play in the delivery of these exercises or activities.

In order to help the researcher achieve their aims and goals it is necessary to have research questions. These research questions provide the researcher with direction and assist them in finding the appropriate literature required to achieve those aims and goals. This literature review will endeavour to find the answers to three specific research questions:

- 1 How does regular exercise or physical activity affect physiological changes?
- 2 What exercises are of most benefit as a health promotion tool for the elderly?
- 3 What is the nurses' role in the use of these exercises?

### 3 THEORETICAL BACKGROUNDS OF BENEFITS OF EXERCISE

Regular exercise or physical activity is important for the elderly as a way of maintaining good health. As we get older our body systems undergo a natural deterioration and so it becomes even more essential that we take care of our physical condition to enable us to prolong our ability to independently perform everyday activities. Many of these physical changes or deteriorations cannot be avoided, for example, our bones become more brittle due to a slowing down in protein synthesis and they lose their mass due to demineralisation. Muscle mass is lost, thereby leading to a reduction in strength and flexibility, and a slowing of reflexes. (Tortora & Derrickson 2008. pages 18 & 318). We become much more susceptible to diseases such as osteoporosis, osteoarthritis, and cataracts, and indeed, older people are more likely to suffer from more than one disease at a time. (Underwood & Hunter, 2004 page 26.)

Other physiological changes related to age include impaired eyesight and hearing, decrease in elasticity of our skin, and increased risk of diseases such as type 2 diabetes mellitus (DM II), cardiovascular diseases, and hypertension. One other factor not specifically related to physiological changes caused by aging, but having a detrimental effect on our overall physiology is the tendency for older people to “slow down” and to begin leading a more sedentary lifestyle. This sedentary lifestyle may help to speed up the decline in muscle and bone strength and cause individuals to become more lethargic.

Perhaps due to the fact that people are living longer, there have been massive increases in the incidences of ill-health in the elderly, causing a major health worry worldwide. These increases of ill-health can bring not only great suffering to individuals but may also place a heavy financial burden on national health services.

A stark example of this can be shown in a study carried out in Ireland in 2004. It found that 86% of the elderly population had received drugs for the treatment of at least one out of nine named chronic diseases, including cardiovascular disease, central nervous system disease, and musculoskeletal disease, and that around 75% of the elderly population suffered from at least two of the nine chronic conditions. The average cost per patient per year for drugs alone was 316 euros for one condition, 609 euros for two conditions, and rising to an incredible 1164 euros for a patient suffering from four chronic conditions. (Naughton & Bennett & Freely, 2006. pages 633-636).

Another example of the problems caused by ill-health in older people can be read in an on-line article written by Megan Johnston for the Canadian association of Cardiac Rehabilitation. She writes that in 2001 over 40% of elderly Canadians reported suffering from at least one chronic disease, mobility impairment, or disability, with mobility problems being reported by around 80%. She further reports that about 60% of elderly Canadians are inactive and so are not benefitting from the health effects that regular exercise can give, and subsequently find difficulty in performing ADL's. (Johnston, 2008).

A literature review about how exercise can help in the prevention of falls in older people stated that age-related changes in somatosensory, visual, vestibular, and musculo-skeletal systems are likely to contribute to an increased risk of falls in older people, and that exercise may be a factor in preventing these falls. It is written that

around 90% of hip fractures are caused by falls and in the year 2000 they cost the UK government 1.3 billion pounds, whilst in the US they are responsible for an annual cost of 10 billion US Dollars. (Carter, Kannus & Khan, 2001. pages 427-438).

Finally, a study carried out in the Satakunta region of Finland between the years 1999 and 2000 showed that of a population of 41,408 over the age of 65, a total of 461 underwent an operation for a hip fracture. They found that in 87.7% of cases, the mechanism of injury was caused by falling, and that of the total number of people studied, 41.9% suffered their injury whilst living in an institution. (Jaatinen, Panula, Aarnio & Kivela, 2007. pages 256-260). So we can easily see from these figures how severe a financial burden ill-health in elderly can cause to national health services and that these health services need to look into ways of reducing these costs.

#### 4 SOLUTIONS TO THE RESEARCH PROBLEMS

##### 4.1 How regular exercise or physical activity can affect physiological changes.

It is well-documented and widely accepted that regular exercise or physical activity can produce many benefits with regards to health promotion. We know from previous research that regular exercise or physical activity can help to maintain weight, reduce high blood pressure, reduce the risk of cardiovascular disease, and help reduce the risk of diabetes mellitus.

In an article from the Centers of Disease Control in the USA it is stated that participation in regular physical activity is one of the most important factors in maintaining good health. They also write that regular physical activity can maintain and increase the strength of our muscles and bones, improve our mental health, increase our chances of living longer, and although there may be some small risks in partaking in physical activities, the benefits far outweigh the risks. (Centers for Disease Control and Prevention. Physical Activity and Health- The Benefits of Physical Activity, 2011).

In another article from a project by post graduate students in the Master of Science program in Exercise Science in the Department of Kinesiology and Health at Georgia State University they declare that regular exercise and physical activity can produce

many health benefits such as reducing the risks of developing heart disease, reduce and/or prevent hypertension, reduce the risk of hyper cholesterol and diabetes mellitus type 2, and help to reduce the risk of early death. (Doyle, 1997).

In the 2008 Surgeon General's report on physical activity guidelines for Americans they write that all adults should try to avoid being inactive because some exercise is always better than none. The report explains that a physically active adult has a healthier body, both in terms of size and composition, than a less active adult, they have better fitness and are less likely to develop many chronic diseases, and these benefits can be gained by both male and females, and across all races and ethnicities where studies have been conducted. (Physical Activity Guidelines for Americans, 2008.)

#### 4.2 Exercises that are of most benefit as a health promotion tool for the elderly.

There is now an enormous amount of literature available for health care givers when looking for advice on the suitability of exercise for elderly people. Many articles give recommendations for the type, duration, and intensity, and some also give instructions on how to perform various exercises. Several exercise programmes for older people have targeted the musculoskeletal system in order to improve balance and muscle tone by means of strength or resistance training, whilst others have adopted aerobic training in order to target cardiovascular, respiratory, and metabolic systems. Furthermore, when assessing their clients some studies tested for improvements in cognitive abilities, depressed mood, some tested for changes in the metabolism, whilst others tested for changes in strength and balance, or endurance.

In an article from the publication *Geriatrics*, entitled "Prescribing exercise for the frail and home bound" it states that there is a consensus of opinion that older adults should try to achieve an exercise goal of 30 minutes of moderate-intensity activity 5 times per week. They say that being old is not a contraindication to exercise and those older adults can participate in physical activities so long as a medical evaluation is carried out beforehand. (Struck & Ross, 2006).

In her article for the Canadian Association of Cardiac Rehabilitation, Megan Johnston writes that cardiovascular fitness, resistance training, and flexibility are of particular importance for elderly people. She says that by performing activities such as walking

briskly, doing housework, and climbing stairs can assist elderly people to achieve a recommended goal of 30 minutes medium-intensity exercise. These activities can be performed every other day, thereby allowing for adequate rest periods. Further recommendations include carrying out resistance training, with the over 65's carrying out one set of between 8 and 10 different multi-jointed exercises that include all major muscle groups, using only a little resistance. Each exercise should consist of 15 repetitions, and as the person's strength increases, raising the number of repetitions before raising the level of resistance. It also states in the article that it is important that elderly people have adequate range-of-motions of all their body parts, which may be improved by including stretching exercises. This would ensure that the musculoskeletal system is able to balance properly and be more agile. (Johnston, 2008. pages 1-3).

Robert Nied and Barry Franklin have written an article entitled "Promoting and Prescribing Exercise for the Elderly", which was published in the American Family Physician journal. In this article they describe some of the benefits of exercise, possible contra-indications to exercise, what an exercise prescription should contain, and how healthcare professionals can promote physical activity in older people. They recommend that moderate aerobic activity of at least 30 minutes, at least four days per week, a single set of 10 different exercises of 10 to 15 repetitions two or three times per week followed by major muscle stretching, and balance training twice per week should be carried out by older people. They also provide descriptions of different exercises (Nied & Franklin, 2002. pages 419-425).

#### 4.3 The nurse's role in the use of these exercises.

Many health care professionals may be of the opinion that exercise is purely the domain of physiotherapists. However, in the Kozier and Erb's Fundamentals of Nursing it is written that a nurse assumes many different roles when providing care to clients. The traditional role of a nurse is obviously as a caregiver, providing physical and psychological assistance to those that need it. But in relation to exercise and health promotion the nurse can act as an advocate, presenting the older person's need for regular exercise to facility managers, budget holders, and other health care providers. The nurse can be a coach, informing about the benefits of regular exercise, the risks involved, and some guidance on the type, duration, and intensity of the exercise prescription, and perhaps as a cheerleader assisting and encouraging the participation in

any prescribed exercise programmes (Berman, Snyder, Kozier & Erb, 2008 pages 13-14, 407 & 410).

In chapter 23 of the same publication it states that nurses need to be aware that promoting health and assessing and promoting a person's ability to carry out ADL are important for people over 65 who perhaps still have over 19 years to live, and that physical activity and exercise are focus areas in achieving this (Berman et al, 2008. page 407).

An online article called "Nurses as partners in delivering public health" has been published by the Royal College of Nursing in May 2007, the purpose of which was to illustrate the contribution of nurses to improving the health of communities. In the article it was written that one of the aims of delivering public health through nursing is to increase life expectancy by influencing healthy behaviours. They described a variety of nursing initiatives aimed at improving the health of individuals, families, and communities. One of these initiatives involved educating the staff of 16 elderly care facilities in ways to reduce the number of falls among the residents, thereby reducing the time in hospital and having a positive impact on the resident's quality of life Royal College of Nursing, 2007).

In a 2009 article by Jennifer Hartford for the HNews website called "The Role of the Nurse in Health Promotion" it is explained that nurses play a huge role in health promotion and in these days of budget restraints it is just as important to care for the healthy as it is to care for the sick. She writes that nurses can do this by providing good information through client teaching, encouragement, and being good ambassadors of wellness (Hartford, 2009).

## 5 IMPLEMENTATION OF THE RESEARCH

### 5.1 Purpose and goal of the research

The purpose of the research was to explore the evidence about the benefits of exercise as a tool for health promotion in older people, discover what types of exercise could be most beneficial in allowing older adults to prolong their independence in carrying out



normal daily activities, and to examine what the nurse's roles would be in using those exercises. The goal would then be that any of the evidence collected could be used to inform those nurses responsible for elderly care about potential benefits of regular exercise, what types of exercise could be most beneficial, and how nurses can use exercise prescriptions effectively for health promotion.

The most challenging aspect of this literature review was the researcher's lack of experience in the field of research. This led to problems with what type of literature review to adopt, either a narrative or systematic review, and what type of data would be collected, qualitative or quantitative. The choice between narrative and systematic has been covered earlier in the thesis and so we can try to explain a bit about the differences between qualitative and quantitative data.

As briefly explained previously, when writing a narrative literature review the data collected and presented is always qualitative, however the author endeavoured to find out the differences between qualitative and quantitative data.

What is the difference between quantitative and qualitative research? Simply speaking, quantitative research generates numerical data or information that can be converted into numbers, whereas qualitative research generates non-numerical data. What this means is that only measurable data are being gathered and analysed in quantitative research, whilst qualitative research data focuses on the collection of mainly verbal or written data rather than measurements, which are not always possible to put into numerical graphs. In both types of data the collected information is then analysed in an interpretative manner, whether it is subjective, impressionistic or even diagnostic.

The aim of a qualitative research is to provide a complete, description of the research topic, and it is usually more exploratory in nature. Conversely, quantitative research focuses more in counting and classifying features and constructing statistical models and figures in order to explain what has been observed. Quantitative research provides the researcher a clearer picture of what to expect in his research compared to qualitative research. In qualitative research the researcher serves as the primary data gathering instrument. Here, the researcher employs various data-gathering methods; choosing one which best suits their type of research project. Examples of data-gathering strategies used in qualitative research are individual in-depth interviews, structured and non-

structured interviews, focus groups, narratives, content or documentary analysis, participant observation and archival retrieval. Quantitative research uses tools such as questionnaires, surveys, measurements and other similar ways to collect numerical or measurable data.

The presentation of data in a qualitative research can be in the form of words (from interviews) and images (videos), whereas, if you are conducting a quantitative research, the most likely items will be tables containing data in the form of numbers and statistics.

Qualitative research is primarily subjective in approach as it seeks to understand human behaviour and reasons that govern such behaviour. Researchers have the tendency to become subjectively immersed in the subject matter in this type of research method. In quantitative research, researchers remain objectively separated from the research topic. This is because quantitative research is objective in approach in the sense that it only seeks precise measurements and analysis of target concepts in order to answer research questions.

Debates have been on-going for many years as to which method is better than the other. However, the truth is that each has its own strengths and weaknesses which vary depending upon the research topic. This then leads us to the question “Which method should be used?” If your study aims to find out the answer to an inquiry through numerical evidence, then you should make use of quantitative research. On the other hand, if in your study you wish to explain further why a particular event happened, or why a particular phenomenon exists, then you should make use of qualitative research. Some studies make use of both quantitative and qualitative research, letting the two complement each other. For example, if you want to study what the dominant human behaviour is towards a particular object or event and at the same time want to examine why this is the case, it is then ideal to make use of both methods (Experiment-Resources.com, 2009).

Other problems faced by the author were, not knowing how many relevant articles or studies to include in the review, how to extract relevant information, how to analyse the collected data, and how to present the findings.

## 5.2 Research material and methods

According to Moule and Goodman, researchers must employ certain techniques when collecting data for the purposes of answering research questions. Some of the techniques used can be measurement, observation, or recording of data. They explain the importance of selecting the correct method for your particular requirements and provide some examples of how the various methods can be employed; including listing the strengths and weaknesses of each different method (Moule & Goodman, 2009. Ch. 21 pages 288-321).

To address the subject “Exercise as a tool for health promotion of older people” the method chosen for this narrative literature review is a small-scale documentary analysis utilising text books and literature published on-line. This was carried out by means of a computerised literature research on the PubMed database using the terms “Benefits of exercise for older people” and “Exercise as a health promotion tool for older people”, and by reading various nursing text books. Several studies, trials and other articles relating to exercise in the elderly were retrieved and all articles, along with their reference lists, that seemed relevant to the review were considered for inclusion.

From those, a total of 8 studies were identified for inclusion in the review. They all carried out studies where exercise was used as a means of trying to effect changes in the cognitive, physical, mental, or metabolic health of institutionalised or community-dwelling elderly adults. As previously mentioned, it was the intention to carry out a narrative literature review in order to give the reader a broader outlook of the current literature on the topic of exercise as a tool for health promotion in the elderly. The literatures chosen for this review were chosen not only because they all have the common theme of using exercise to highlight health benefits in the elderly but also because they all targeted different areas of the body and used different types of exercises. By choosing the literature for inclusion in this manner it was hoped that the author could succeed in providing a broader view of the topic.

## 5.3 Analysis of the material

Table 1 shows that although the eight pieces of literature adopted different measures for implementing their studies, including the types of exercises used, the targeted areas of

the human body or mind, and the methods used for collecting their data, they all showed positive effects to the health of elderly people when carrying out regular exercise or physical activities.

In a Brazilian study about effects of exercise on functional performance of institutionalised elderly there were no significant differences in the baseline data (before exercise intervention) between the two groups. However, after undertaking the exercise program the exercise group had significant improvement in the performance of functional tests, lower-limb function, gait velocity, mini mental state evaluation (MMSE), and strength. The non-exercise group showed significant diminishment in functional ability, lower-limb function, gait velocity, and the MMSE. One interesting piece of data showed that the non-exercise group had a significantly longer time in institutional care when compared to the exercise group, which may need further investigation to discover if this longer time is significant to health deterioration (Bastone & Filho 2004, 662).

In a study about the effects of exercise on metabolism by Raul Martins, Manuel Verissinmo, Manuel Coelho e Silva, Sean Cumming and Ana Teixeira, subjects were split into three groups, an aerobic-oriented exercise group, a strength-based exercise group, and a non-exercise control group. Again, there were no differences at baseline between the groups in any of the studied variables. After completion of the program there was no significant differences between the group carrying out aerobic exercises compared with the group carrying out strength training, but both exercise groups attained significant improvements in body weight, waist circumference, BMI, diastolic blood pressure, cholesterol levels, and a 6-minute walk test, whereas the control group only showed improvement in waist circumference (perhaps the similar improvements in waist circumference can be explained by all groups having the same type of dietary intake for the duration of the program) (Martins, et al, 2010, 9:76).

Laura Baker, Laura Frank, Karen Foster-Schubert, Pattie Green, Charles Wilkinson, Anne McTiernan, Stephen Plymate, Mark Fishel, G. Stennis Watson, Brenna Cholerton, Glen Duncan, D. Mehta and Suzanne Craft carried out a trial on the effects of exercise on mild cognitive impairment and discovered that after a 6-month aerobics training course, subjects showed significant effects on cognition, glucose metabolism, and hypothalamic-pituitary-adrenal axis, whilst a stretching-only control group showed no

improvement during the same period. Interestingly, this study also showed different levels of improvement in females compared to males (Baker et al, 2010, pages 74-76).

Similarly, the findings of a population-based study entitled “Physical Exercise, Aging, and Mild Cognitive Impairment, indicated that the potential for significant benefits exists in the relationship between physical exercise and cognition. It goes on further to say that any frequency of moderate exercise either in mid-life or later life was associated with a reduction in the odds of having mild cognitive impairment (Geda & Roberts & Knopman & Christianson & Pankratz & Ivnik & Boeve & Tangalos & Peyerson & Walter & Rocca 2010, 82-85).

In a study carried out in Korea they used dancing to measure the effects of exercise on the cognitive functioning of elderly people who suffered from metabolic syndrome. Their research included 38 elderly patients, consisting of 26 in an exercise group and 12 in a control group, who suffered from metabolic syndrome but who had normal cognitive function. The exercise group carried out dancing exercises twice weekly over a 6 month period using the dance “Cha cha” as the exercise intervention, whilst the control group did no dancing. All participants were tested before and after the 6 month programme using a Korean version of the Consortium to Establish a Registry for Alzheimer’s disease, known as CERAD-K. Results showed that the exercise group improved their verbal fluency, word list delayed recall, word list recognition, and their overall CERAD-K score when compared to the control group. Other results showed, however, that the exercise group did not improve their prognosis for their metabolic syndrome. The researchers concluded that their study had shown that dancing was an effective method of improving elderly people’s cognitive functioning (Se-Hong Kim, Minjeong Kim, Yu-Bae Ahn, Hyun-Kook Lim, Sung-Goo Kang, Jung-hyoun Cho, Seo-Jin Park and Sang-Wook Song 2010, pages 10 & 671-678).

The next study included in this literature review was based in Southern California from 1984 to 1987, and was a study of cross-sectional and prospective associations of exercise with depressed mood. The participants were a community-based sample of older men and women aged between 50 and 89 years of age. The researchers reported that people who were carrying out regular exercise of up to 3 times per week showed lower depression scores when compared to participants who performed less exercise and that their findings confirmed what other studies have previously shown, that

exercise is cross-sectionally associated with less depressed mood among older people. However, they also reported that the sample of people who participated in the study had a relatively low mean depression score at baseline, probably due to most of the participants having both a high socioeconomic and education status, and that other factors affecting depression were not considered, for example people with less family or friend networks may have a more depressed mood than those with a large support network surrounding them. They also say that their study shows that regular exercise in elderly people does not provide protection against future depressed mood and they conclude that either exercise leads to less depressed mood, or that a depressed mood may lead to less exercise (Kritz-Silverstein, Barret-Connor & Corbeau, 2000. pages 596-603).

The study carried out in Hong Kong by Kwok, Lam, Wong, Chau, Yuen, Ting, Chung, CY, and Ho attempted to make a comparison between the effectiveness of a customised coordination exercise and a strength exercise when trying to make improvements in the cognitive functioning and physical mobility on the elderly. They selected elderly participants from two separate care facilities and allocated them to either an 8-week coordination training program or to an 8-week towel exercise program. In order to measure the participants cognitive state at baseline they carried out a Chinese Mini-Mental-State exam and also used the Chinese Dementia rating Scale. For the physical mobility baseline levels they employed a Timed Up-and-Go test. All these tests were then repeated at the end of the 8-week program for both sets of participants. There results showed improvement in both groups after the program and they concluded by saying that their findings demonstrated that low-intensity level mind and body exercise could be of benefit to the cognitive functioning of older adults (Kwok et al, 2011. pages 261-267).

The final study included in this narrative literature review was carried out in Florida in the USA by Bulat, Hart-Hughes, Ahmed, Quigley, Palacios, Werner, and Foulis. This study was also carried out over an 8 week period on 51 community-dwelling older adults who were already at risk of falling. The study had the objective of trying to determine the effectiveness of a functional balance training class on balance outcomes. The design of the study was a pre-test/post-test using retrospective data using the Berg Balance Scale, Limits of Stability(LOS), and a modified Clinical Test of Sensory Interaction on Balance (mCTSIB), and was carried out in the patient safety center of the

James. A Haley Veterans Hospital. The participants were put into small groups of 4-5 people and had a weekly 1-hour balance training class with results showing considerable improvements in both the Berg and Composite Reaction Time after the program. They concluded their study by declaring that an 8-week group functional balance training class proved to be both a safe and effective way to improve balance outcomes in a cohort of elderly people at risk of falling.

Table 1. Summary of studies or trials that used exercise as a means of trying to effect changes in the cognitive, physical, or metabolic health of elderly adults.

AUTHORS	PARTICIPANTS	INTERVENTIONS	RESULTS
Bastone & Filho Sep/Oct 2004	40 residents of an elderly home in Brazil aged between 60 to 99, split into 2 groups, one exercise and one comparative. A mean age of 76 in the exercise group and a mean age of 80 in the comparative group.	Exercise group of 19 on a 6 month programme of regular exercise with assessment of functional performance, isometric strength of knee extensors, proprioception of lower limbs, mental status, and depression symptoms. Comparative group had no exercise but had the same assessments.	The exercise participants showed significant improvement in functional performance, knee extensor strength, and lower limb tests. Comparative group showed significant decreases.
Martins et al 2010	63 individuals with a mean age of 76 assigned to an exercise group or a control group. Exercise group was further split into either an aerobics or strength-based group. All participants lived in the same institution.	Aerobic group of 18, exercising 3 times per week for 16 weeks. Strength-based group of 14, exercising 3 times per week for 16 weeks. Control group had no exercise. All participants had similar dietary intake and were tested before and after the programme for functional fitness, blood pressure levels, body mass index, weight, a 6 minute walk distance test, waist circumference, and blood cholesterol levels.	Exercise groups had significant improvement in all tests after the programme, whilst the control group only had significant changes in waist circumference.
Baker et al Jan 2010	33 adults with amnesic mild cognitive impairment between the ages of 55 to 88, with a mean age of 70, split into 2 groups of either an exercise group or control group.	Exercise group of 23, exercising 4 days per week for 6 months and a control group of 10, carrying out stretching exercises 4 days per week for 6 months. Participants carried out gluco-metabolic and treadmill tests before and after the programme. At baseline, 3 <sup>rd</sup> month, and 6 <sup>th</sup> month blood was tested for assay, and cognitive tests were administered.	6 months of aerobic exercise had sex-specific effects on cognition, glucose metabolism, and hypothalamic-pituitary-adrenal axis and trophic activity, along with gains in cardio-respiratory fitness and body fat reduction in the exercise group when compared to the control group.
Geda et al Jan 2010	A total of 1324 subjects without dementia where asked to complete a physical exercise questionnaire in order to investigate whether or not	This was a population-based case-control study in which the frequency of physical exercise among 198 subjects with MCI was compared with that	Analyses where adjusted for age, sex, number of years in education, medical co-morbidity, and presence of depression. The study revealed that

	physical exercise could be associated with a reduced risk of mild cognitive impairment (MCI).	among 1126 subjects with normal cognition.	any frequency of moderate exercise performed in mid-life was associated with reduced odds of having MCI.
Bulat et al 2007	51 community-dwelling elderly people with a mean age of 78 who were assessed as at risk for falls.	Weekly one hour functional balance training classes for 8 weeks in small groups of 4-5 participants. Pre and post intervention measurements of Berg Balance Scale, Limits of Stability, and a modified Clinical Test of Sensory Interaction on Balance (mCTSIB) were carried out on all participants.	84% of participants completed 5 or more weekly classes. After the 8 week intervention there was a significant improvement in the Berg, and Composite reaction Time with the conclusion that an 8-week group functional balance training class was a safe and effective method used in improving balance in a sample of elderly people at risk of falling.
Kwok et al 2011	40 elderly (3 male & 37 female) selected from 2 elderly centres of the Hong Kong Lutheran Social Service with a mean age of 79 with normal cognition.	20 participants from one elderly centre were given an 8 week co-ordination training (CT) programme similar to Tai Chi, whilst the participants from the other centre were given an 8 week towel exercise (TE) programme, which was mainly a stretching routine. A Chinese Mini Mental State Examination and Chinese Dementia Rating Scale (CDRS) were used to measure the cognitive functioning of participants, and Timed Up & Go test for physical mobility before and after the programme.	Tests showed that that the CDRS scores of both the CT and TE groups improved significantly after training, with a conclusion that a low-intensity mind-body exercise could be beneficial to the cognitive functioning of the elderly.
Se-Hong Kim et al 2011	38 elderly patients with metabolic syndrome having normal cognition. 26 in an exercise group and 12 in a control group.	The exercise group were given dance exercises twice per week for 6 months and cognitive function tested using the Korean version of CERAD. Repeated measurements of ANCOVA was used to assess the effect of dance exercise on cognitive function and cardiometabolic risk factors.	tests showed that the exercise group improved significantly in verbal fluency, word list delayed recall, word list recognition, and overall CERAD-K scores after the program. Conclusion was that dance could be effective in improving cognitive ability in older adults with metabolic syndrome.
Kritz-Silverstein et al 2001	Community-based sample of older men and women living in Southern California aged between 50-89 years.	Cross-sectional and prospective association between exercise and depressed mood. Depressed mood was measured using the Beck Depression Inventory and people classed with categorical depression or with physical limitations affecting exercise were excluded.	Results showed that people who exercise have less depressed mood. However, exercise does not protect from future episodes of depression for people not clinically depressed at baseline.



## 6 RESULTS AND CONCLUSIONS

The results seem to show fairly conclusively that participating in regular exercise or physical activity has many health benefits for elderly people. In all the literature read by the author there was not one single negative outcome reported when older people participated in prescribed exercise programmes. The many benefits to health included improvements in the cardiovascular and musculoskeletal systems, as well as improvements in cognition and metabolic systems, although the effects on a person's depressed mood was not quite so conclusive.

What was also clear was that, just like any age-group, elderly people must be given a health check before undertaking any kind of exercise program in order to avoid potential injury or ill-effects. We, as nurses must be aware of our client's limitations and their abilities to carry out ADL's so that we can help physiotherapists and physicians tailor exercise prescriptions to each individual's needs and desires.

All these reported health benefits can also reduce costs to health services by possibly reducing the amount of time nurses and caregivers need to spend with clients, a possible reduction in the amount of time patients/clients spend in care facilities, and a possible reduction in the amount of different medications required by elderly people.

## 7 REVIEW OF RELIABILITY

Ensuring the reliability and validity of qualitative research can be a difficult process because often the data collected comes from people's personal opinions or thoughts and research is often influenced by the researchers own biases, whereas in quantitative research, where we are dealing mostly with numbers and percentages, it can be much more simple to convince readers that the research was reliable and valid. For example, for quantitative data someone can easily count the number of students in our group and how often they are absent from class, but in qualitative data we can interview students what life is like in our class and why they fail to attend regularly. Obviously this data can be much more difficult to interpret.

In a thesis written by Jyrki Pulkkinen at the department of education in Oulu University he writes that the requirements of validity and reliability of qualitative research have been under scrutiny for a long time and that discussions still continue about the best methods to use (Pulkkinen, 2003. page 48).

Moule and Goodman say that the measures of validity and reliability used in quantitative research cannot be transferred into qualitative research and finding suitable measures has been a challenging process. They describe four key elements needed to establish the trustworthiness of qualitative research, including credibility, dependability, confirmability, and transferability. They say that all research must be shown to be credible and that researchers can employ many steps to convince the reader that what they are reading can be believable. Researchers can try to obtain data using different methods, e.g. interviews and observation, or use more than one researcher to gather data. They explain that one way to measure confirmability and dependability is to use an “audit trail”. This involves the researcher presenting an audit trail of the methods, presentation of data, and analytical processes used which can then be audited by an external researcher (Moule & Goodman, 2009. Pages 189-191). Trying to find guidance on reliability measures for use on a narrative literature review has been difficult and frustrating.

One of the major limitations of this review is an inconsistency in the methods used to measure the key variables such as cognition, metabolism, depression, physical functionality, aerobic fitness, and strength, whilst there is also an inconsistency in the types of exercises used during the trials/studies, thereby preventing a presentation of results aimed at a specific type of exercise or targeted area of the body. This diversity of study methods can also be seen as a positive in that the author has tried to show results from the different types of exercises used and the areas of the body targeted in order to find a broad range of information for readers.

Furthermore, the reliability of this review could be open to debate due to the relatively low number of studies analysed. However, the author believes that all the studies and other articles referenced in this thesis were taken from reputable books, e-journals, or other publications, and each piece of literature read or analysed contained fairly consistent information, along with comprehensive reference lists, some of which the author has used in the theoretical framework.

## 8 DISCUSSION

### 8.1 General discussion

There are some key areas that can be discussed within this topic. Firstly there is the argument about whether or not providing exercise for older people is a nurse's responsibility. Some nurses or other health care professionals may contend that it is the responsibility of physiotherapists and physicians. However, the author would argue that the nurse plays an absolutely vital role in both the encouragement and education of clients, as well as in the actual delivery of certain exercise prescriptions. When we consider that the nurse spends more time on a daily basis with the client when compared to other members of the health care team, surely it is the nurse who is better placed to understand the client's limitations when performing ADL's and so can target the areas requiring improvement?

Secondly, due to the ever-growing elderly population is there a case for placing greater emphasis on the importance of regular exercise or physical activity as a tool for health promotion in older people? Should this subject be taught more thoroughly at nursing degree level so that nurses are made aware of the possible benefits at a much earlier stage of their career? I would suggest that Kemi-Tornio University of Applied Sciences, or indeed all universities of applied sciences in Finland, should provide more education on the possible health benefits of regular exercise or physical activity among all age groups but especially for the elderly. There is already an existing course on the current curriculum called "Health promotion of Adults" into which this extra theory could be placed.

### 8.2 Ethical discussions

Perhaps when we think about research ethics we automatically think about the effects a particular study or research experiment may have on the research participants. For example when carrying out research on the effects of a particular drug on mice or other animals. However, medical research ethics also covers many different parts of the research process including the methods used, how the results are interpreted, and how those results are reported.

In an online article from the National Institute of Environmental Health Sciences by Dr David B Resnik entitled “What is Ethics in Research & Why is it Important?” He writes that in order to protect research participants as well as ensuring the integrity and honesty of research, most organisations involved in research have adopted specific codes, rules, and policies relating to research ethics. He describes many of the principles used including honesty, in which the researcher should report data, results, and methods and procedures used in an honest manner, without fabricating, falsifying, or misrepresenting the data collected.

Another principle is objectivity where the researcher should try to avoid bias in his data collection method, data analysis, and results interpretation. Other principles mentioned are integrity, carefulness, openness, and respect for intellectual property. He writes that the researcher should avoid careless errors and negligence, and examine their own work, and they should be sincere and remain true to any agreements entered into.

Acknowledgement and credit must always be given to publishers or authors whose work has been used in their research, and never commit plagiarism (Resnik, D. B, 2011).

It is the author’s opinion that by employing the methodology used in this literature review there was a better possibility to avoid carelessness and bias and he has endeavoured to ensure that all material used has been properly referenced both in the text and the bibliography. The author has tried to provide an up-to-date, balanced review and both positive and negative results have been reported in an honest and open manner.

One ethical question that has been bothering the author and, in some ways contributed to the initial interest in this topic is the question of cost in implementing regular exercise or physical activities for older people. In a discussion during practical training about the rapid decline in the overall health of a patient with Alzheimer’s disease, it was asked why such a disease could cause the patient to rapidly lose muscle mass and become confined to bed. It was explained that, although his disease could affect him physiologically, mainly his decline in health was related to the sedentary lifestyle he was living in the care centre. His sedentary lifestyle was being partly blamed on the fact that the care facility did not have enough staff to allow for the amount of one-on-one supervision that would be required for him to carry out regular exercise or physical

activity, and partly that the staff did not think he was capable of participating in such a programme. It was noted that there was no organised physical activity or exercise programme for any of the facility's residents, which was put down to the fact that the care facility did not have the financial resources to employ the staff required to supervise such activities.

As previously discussed, the financial costs of sickness and ill-health in older people places an enormous burden on national health services. Perhaps by health care facilities not having the resources to employ enough staff to supervise regular exercise activities, subsequently leading to declines in resident's overall well-being and requiring more assistance from nursing staff to carry out ADL's, they are indirectly contributing to these costs? Is it ethical to deny the opportunity for older people to participate in regular exercise or physical activities when the participation in such activities could result in them having a more independent and better quality of life, simply because of money?

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